# 12. A CHECKLIST OF ANTS OF THIRUNELLI IN WAYANAD, KERALA

K.A. Karmaly[1,3], S. Sumesh[1,4], T.P. Rabeesh[1,5] and Lambert Kishore[2]

[1]Department of Zoology, St. Xavier's College for Women Aluva, Kerala 683 101, India.
[2]Department of Zoology, Malabar Christian College, Calicut, Kerala 673 100, India. Email: lambert3698@rediffmail.com
[3]Email ID: dr.karmaly@gmail.com
[4]Email ID: sumeshsdas@gmail.com
[5]Email ID: rabeeshtp@gmail.com

## Introduction

Wayanad is in the north-east of Kerala, India. Study sites are located at Thirunelli (11°27'-15°58' N; 75°47'-70°27' E) in Wayanad region, southern part of Western Ghats. Biogeographically, Wayanad region of Western Ghats is a transitional zone between the moist-deciduous and dry-deciduous forests, harbouring many restricted habitats, endemic species, as well as disjunctive populations of species that are found in moist deciduous, evergreen and dry-deciduous forests (WWF 2001).

Thirunelli forests spread over an area of 20.55 sq. km and occur at an elevation of *c*. 900 m and above. The distance from the mean sea level and forest cover creates a salubrious climate in the region. Generally the year is divided into four seasons; cold (10 °C), and hot (35 °C) weather, South-West and North-East monsoon. The average rainfall is 2,200 mm per year. Climate of Wayanad are characteristic of the Western Ghats and the flora and fauna are showing very rich biodiversity.

The present study attempts to record the ant fauna in deciduous and shola forests at Thirunelli in Wayanad. The ants collected from different parts of Thirunelli were identified using taxonomic keys.

## Methodology

The collection of ants is made by random sampling methods with sweep net, brush method and all out search method. The collected specimens were processed, preserved in 70% ethanol and prepared in the laboratory for systematic studies. The specimens were mounted on a rectangular card of 20 mm x 10 mm and pinned with Asta insect pins of 38 mm x 0.53 mm of No.3. Observations were made using High-performance, Modular Stereozoom microscope with a 40x magnification. Ants were identified using identification key by Bolton (Bolton 1994) and Fauna of British India (Bingham 1903).

## Observation and Result

Considering the study of distribution of ants in Thirunelli-Wayanad area, 39 ants were found (Table 1) belonging to six subfamiles (Bolton 1994).

In Dolichoderinae, five species were found: *Tapinoma melanocephalum melanocephalum* (Fabricius). *Tapinoma indicum indicum* (Forel), which are common in these areas and present in the litter floor of all forest vegetation of Thirunelli-Wayanad region, *Technomyrmex albipes albipes* (Smith) was commonly found in all vegetation, and *Technomyrmex bicolor bicolor* Emery and *Technomyrmex elatior* Forel were rare.

Subfamilies Aenictinae and Dorylinae with three species was the least dominant: in Aenictinae, *Aenictus ambiguus* Shuck, *Aenictus westwoodi* Forel, were mostly found in western India and in Dorylinae, *Dorylus orientalis* Westwood, common in southern India.

Thirteen species of ant belong to Subfamily Formicinae, the dominant family in Thirunelli. *Anoplolepis gracilipes* (Smith), found throughout the region, *Oecophylla smaragdina* (Fabricius), *Camponotus angusticollis angusticollis* (Jerdon), *Camponotus compressus* (Fabricius), *Camponotus parius* Emery, *Camponotus sericeus sericeus* (Fabricius) were common in this area, *Camponotus misturus fornaronis* Forel and *Camponotus radiatus* Forel were rare in this region, *Polyrhachis illaudata illudata* Walker and *Polyrhachis punctillata punctillata* Roger are the first report from Wayanad region, and *Polyrhachis convexa* Roger is the first report from the Indian subcontinent; Roger (1863 a) reported this species from Sri Lanka. *Lepisiota opaca opaca* a less dominant group was also found from this region.

Subfamily Myrmicinae showed 14 ant species. *Myrmicaria brunnea* Saunders, *Solenopsis geminata* (Fabricius) were common in the study area. The other non-endemic species – *Cardiocondyla parvinoda* Forel, *Cardiocondyla wroughtoni* Forel, *Crematogaster ebenina* Forel, *Monomorium wroughtoni* Forel, *Pheidole spathifera* Forel, *Pheidologeton affinis affinis* (Jerdon), *Tetramorium smithi* (Mayr), and *Tetramorium wroughtoni* (Forel); *Leptothorax rothneyi* Forel, *Myrmicaria* Saunders sp., *Strumigenys smythiesi* Forel, and *Carebara wroughtonii* (Forel) – were the rare species found from this area.

Five species of subfamily Ponerinae were collected, *Cryptopone* sp. is the first report for Wayanad region. *Diacamma rugosum sculptum* (Jerdon), *Diacamma scalpratum* (Smith), *Leptogenys ocellifera* (Roger), and *Odontomachus haematodes* (Linnaeus) were commonly encountered in the study area.

**Table 1**: Checklist of Ants of Thirunelli in Wayanad

| Genus | species | Synonym | Habitat |
|---|---|---|---|
| **Subfamily: Dolichoderinae** | | | |
| *Tapinoma* | *melanocephalum melanocephalum* (Fab., 1793) | *Tapinoma australe* Santschi, 1928<br>*Tapinoma australis* Santschi, F. 1928<br>*Tapinoma familaris* Smith, F. 1860<br>*Tapinoma nana* Jerdon, 1851<br>*Tapinoma pellucida* Smith, F. 1857 | Moist grass |
| **Distribution in Kerala**: Alappuzha (Muthukulam), Kannur (Aralam farm), Thrissur (Peechi KFRI, Kottapuram), Kottayam, Wayanad (Muthenga, Thirunelli), Malappuram (Calicut University Campus, Mampad College Campus), Ernakulam (Bolghaty, Tripunithura, Edappally), Calicut (Madappally, Devagiri), Idukki (Marayoor, Mathikettan Shola), Kasaragod (KAU Campus Padannakad). | | | |
| *Tapinoma* | *indicum indicum* (Forel, 1895) | - | Moist grass |
| **Distribution in Kerala**: Thiruvananthapuram (Neyyar), Palakkad (Parambikulam), Alappuzha (Muthukulam), Idukki (Meenuli, Thekkady), Wayanad (Muthenga, Thirunelli), Kannur (Aralam farm), Malappuram (Calicut University Campus). | | | |
| *Technomyrmex* | *albipes albipes* (Smith, 1861) | *Technomyrmex albitarse* (Mots., 1863)<br>*Technomyrmex nigrum* (Mayr, 1862)<br>*Technomyrmex rufescens* Santschi 1928<br>*Technomyrmex vitiensis* Mann, 1921 | Moist grass |
| **Distribution in Kerala**: Wayanad (Muthenga, Thirunelli), Kollam (Thenmala), Alappuzha (Muthukulam), Ernakulam (Aluva), Thrissur (Chimmnoy Wildlife Sanctuary). | | | |
| *Technomyrmex* | *bicolor bicolor* Emery, 1893 | - | Moist grass |
| **Distribution in Kerala**: Alappuzha (Muthukulam), Ernakulam (Aluva), Calicut (Anakampoyil, Madappally), Malappuram (Calicut University Campus), Wayanad (Muthenga, Thirunelli). | | | |
| *Technomyrmex* | *elatior* Forel, 1902 | - | Moist grass |
| **Distribution in Kerala**: Wayanad (Thirunelli). | | | |
| **Subfamily: Aenictinae** | | | |
| *Aenictus* | *ambiguus* Shuck, 1840 | - | Subterranean |
| **Distribution in Kerala**: Wayanad (Thirunelli), Kottayam (Pala). | | | |
| *Aenictus* | *westwoodi* Forel, 1901 | - | Subterranean |
| **Distribution in Kerala**: Wayanad (Thirunelli). | | | |
| **Subfamily: Dorylinae** | | | |
| *Dorylus* | *orientalis* Westwood, 1835 | *Dorylus curtisii* (Shuckard, 1840)<br>*Dorylus longicornis* Shuckard, 1840<br>*Dorylus obertheri* (Emery, 1881) | Subterranean |
| **Distribution in Kerala**: Wayanad (Thirunelli, Muthenga), Idukki (Kuttikanam), Palakkad (Nelliyampathy). | | | |
| **Subfamily: Formicinae** | | | |
| *Anoplolepis* | *gracilipes* (Smith, 1857) | *Anoplolepis longipes* (Jerdon, 1851)<br>*Anoplolepis trifaciata* (Smith, 1858) | Everywhere |
| **Distribution in Kerala**: Thiruvananthapuram (Vithura, Peppara), Kollam (Thenmala), Pathanamthitta, Kottayam, Thrissur (Chimmnoy Wildlife Sanctuary), Ernakulam, Calicut, Idukki (Thekkady), Kannur (Aralam), Malappuram (Calicut University Campus), Kasaragod (Cherkala), Palakad, Wayanad (Muthenga, Thirunelli). | | | |
| *Camponotus* | *angusticollis angusticollis* (Jerdon, 1851) | *Camponotus ardens* (Smith, 1858)<br>*Camponotus impetuosa* (Smith, 1858)<br>*Camponotus prismaticus* Mayr, 1862 | Leaves/Soil |
| **Distribution in Kerala**: Ernakulam, Thrissur (Chimmnoy Wildlife Sanctuary), Palakkad (Silent Valley, Aalathur), Malappuram (Calicut University Campus, Kohinoor, Manjeri, Nilambur), Calicut (Anakampoyil), Wayanad (Thirunelli). | | | |

**Table 1**: Checklist of Ants of Thirunelli in Wayanad (*contd.*)

| Genus | species | Synonym | Habitat |
|---|---|---|---|
| *Camponotus* | *compressus* (Fabricius, 1787) | *Camponotus callida* (Smith, 1858)<br>*Camponotus indefessa* (Sykes, 1835)<br>*Camponotus quadrilaterus* Roger, J. 1863 | Leaves |
| **Distribution in Kerala**: Thiruvananthapuram (Peppara, Neyyar, Karyavattom, CTCRI Campus), Kollam, Thrissur (Chimmnoy Wildlife Sanctuary), Palakkad (Parambikulam), Alappuzha (Muthukulam), Idukki (Meenuli, Thekkady), Wayanad (Muthenga, Thirunelli), Kannur (Aralam farm), Malappuram (Calicut University Campus). | | | |
| *Camponotus* | *misturus fornaronis* Forel 1892 | - | Everywhere |
| **Distribution in Kerala**: Idukki (Thekkady), Ernakulam (Kochi, Edappally, Aluva), Malapuram (Calicut University Campus, Madappally, Kohinoor), Calicut (Mampad), Wayanad (Thirunelli, Muthenga), Thrissur (Vellanikara). | | | |
| *Camponotus* | *parius* Emery, 1889 | - | Everywhere |
| **Distribution in Kerala**: Thiruvananthapuram (Vithura, Peppara), Kollam (Thenmala), Idukki, Kottayam, Ernakulam (Kalamassery, Aluva), Thrissur (Manalikkad, Chimmnoy Wildlife Sanctuary), Palakkad (Kottekkad), Malapuram, Calicut, Kannur, Kasaragod (Cherkala), Malabar, Wayanad (Thirunelli). | | | |
| *Camponotus* | *sericeus sericeus* (Fabricius, 1798) | *Camponotus aurulent* (Latreille, 1802)<br>*Camponotus obtusa* (Smith, 1858)<br>*Camponotus pyrrhocephala* (Mots., 1863) | Grassy field |
| **Distribution in Kerala**: Thiruvananthapuram (Vithura, CTCRI Campus, Peppara), Kollam (Thenmala), Kottayam (Bharanaganam), Idukki, Allepey, Ernakulam (Aluva), Thrissur (Vellanikara, Kodungallor), Palakkad, Malapuram (Kohinoor, Calicut University Campus), Calicut (Anakampoil), Kannur, Kasaragod (Cherkala), Wayanad (Muthenga, Thirunelli). | | | |
| *Camponotus* | *radiatus* Forel, 1892 | - | Leaves |
| **Distribution in Kerala**: Malappuram (Kohinoor), Wayanad (Thirunelli). | | | |
| *Lepisiota* | *opaca opaca* (Forel, 1892) | - | Leaves |
| **Distribution in Kerala**: Ernakulam (Aluva), Malappuram (Kohinoor, Calicut University Campus), Wayanad (Muthenga, Thirunelli). | | | |
| *Oecophylla* | *smaragdina* (Fabricius, 1775) | *Oecophylla macra* (Guérin, 1831)<br>*Oecophylla virescens* (Fabricius, 1775<br>*Oecophylla viridis* (Kirby, 1819)<br>*Oecophylla* zonata (Guérin, 1838) | Trees |
| **Distribution in Kerala**: Wayanad (Thirunelli), throughout Kerala. | | | |
| *Polyrhachis* | *convexa* Roger, 1863 | - | Leaves |
| **Distribution in Kerala**: Wayanad (Muthenga, Thirunelli). | | | |
| *Polyrhachis* | *illaudata illudata* Walker, 1859 | *Polyrhachis duodentata* Donisthorpe, 1942<br>*Polyrhachis mayri* Roger, 1863<br>*Polyrhachis latispinosa* Donisthorpe, 1942 | Leaves |
| **Distribution in Kerala**: Wayanad (Muthenga, Thirunelli, Vythiri). | | | |
| *Polyrhachis* | *punctillata punctillata* Roger, 1863 | - | Leaves |
| **Distribution in Kerala**: Wayanad (Muthenga, Thirunelli), Thiruvananthapuram (Vithura), Thrissur (Chimmnoy Wildlife Sanctuary). | | | |
| | **Subfamily: Myrmicinae** | | |
| *Cardiocondyla* | *parvinoda* Forel, 1902 | - | Soil |
| **Distribution in Kerala**: Wayanad (Thirunelli). | | | |
| *Cardiocondyla* | *wroughtonii* (Forel, 1890) | *Cardiocondyla bimaculata* Wheeler, 1929<br>*Cardiocondyla emeryi chlorotica* Menozzi, 1930<br>*Cardiocondyla hawaiensis* Forel, 1899<br>*Cardiocondyla longispina* Karavaiev, 1935<br>*Cardiocondyla quadraticeps* Forel, 1912 | Soil |
| **Distribution in Kerala**: Wayanad (Thirunelli), Palakkad (Silent Valley National Park). | | | |
| *Crematogaster* | *ebenina* Forel, 1902 | - | Trees |
| **Distribution in Kerala**: Wayanad (Thirunelli). | | | |

**Table 1**: Checklist of Ants of Thirunelli in Wayanad (*contd.*)

| Genus | species | Synonym | Habitat |
|---|---|---|---|
| *Leptothorax* | *rothneyi* Forel, 1902 | - | Trees |
| **Distribution in Kerala**: Wayanad (Thirunelli), Palakad (Nelliyampathy). | | | |
| *Monomorium* | *wroughtoni* Forel, 1902 | - | Soil |
| **Distribution in Kerala**: Wayanad (Thirunelli). | | | |
| *Myrmicaria* | *brunnea* Saunders, 1842 | | Soil |
| **Distribution in Kerala**: Wayanad (Thirunelli), throughout Kerala. | | | |
| *Myrmicaria* Saunders, 1842 sp. | | - | Soil |
| **Distribution in Kerala**: Wayanad (Thirunelli). | | | |
| *Pheidole* | *spathifera* Forel, 1902 | - | Soil |
| **Distribution in Kerala**: Wayanad (Thirunelli), Calicut (Madappally). | | | |
| *Pheidologeton* | *affinis affinis* (Jerdon, 1851) | *Pheidologeton australis* Forel, 1915<br>*Pheidologeton bellicosa* (Smith, 1858)<br>*Pheidologeton calida* (Smith, 1863)<br>*Pheidologeton laboriosa* (Smith, 1861)<br>*Pheidologeton mjobergi* Forel, 1918 | Soil |
| **Distribution in Kerala**: Wayanad (Thirunelli), Malappuram (Mampad). | | | |
| *Solenopsis* | *geminata* (Fabricius, 1804) | *Solenopsis bahiaensis* Santschi, 1925<br>*Solenopsis cephalotes* Smith, 1859<br>*Solenopsis clypeata* (Smith, 1858)<br>*Solenopsis coloradensis* (Buckley, 1867)<br>*Solenopsis diabola* Wheeler, 1908<br>*Solenopsis drewseni* (Mayr, 1861)<br>*Solenopsis eduardi* Forel, 1912<br>*Solenopsis galapageia* Wheeler, 1919<br>*Solenopsis geminata medusa* Mann, 1916<br>*Solenopsis glaber* (Smith, 1862)<br>*Solenopsis innota* Santschi, 1915<br>*Solenopsis laboriosus* (Smith, 1860)<br>*Solenopsis laevissima* (Smith, 1860b)<br>*Solenopsis lincecumii* (Buckley, 1867)<br>*Solenopsis mandibularis* Westwood, 1840<br>*Solenopsis mellea* (Smith, 1859)<br>*Solenopsis nigra* Forel, 1908<br>*Solenopsis paleata* Lund, 1831<br>*Solenopsis perversa* Santschi, 1925<br>*Solenopsis polita* (Smith, 1862)<br>*Solenopsis rufa* (Jerdon, 1851)<br>*Solenopsis saxicola* (Buckley, 1867) | Soil |
| **Distribution in Kerala**: Thrissur (KAU Campus), Calicut (Madappaly, Devagiri), Wayanad (Thirunelli), Kollam (Thenmala). | | | |
| *Carebara* | *wroughtonii* (Forel, 1902) | - | Soil |
| **Distribution in Kerala**: Wayanad (Thirunelli). | | | |
| *Strumigenys* | *smythiesii* Forel, 1902 | - | Soil |
| **Distribution in Kerala**: Wayanad (Thirunelli). | | | |
| *Tetramorium* | *wroughtoni* Forel, 1902 | - | Under Stones |
| **Distribution in Kerala**: Calicut (Mampad), Wayanad (Thirunelli). | | | |
| *Tetramorium* | *smithi* Mayr, 1879 | *Tetramorium kanariense* Forel, 1902<br>*Tetramorium laevinode,* Forel, 1902 | Under Stones |
| **Distribution in Kerala**: Wayanad (Thirunelli), Calicut (Devagiri). | | | |
| | | **Subfamily**: **Ponerinae** | |
| *Cryptopone* Emery, 1893 sp. | | - | Soil |
| **Distribution in Kerala**: Wayanad (Thirunelli). | | | |

**Table 1**: Checklist of Ants of Thirunelli in Wayanad (*contd.*)

| Genus | species | Synonym | Habitat |
|---|---|---|---|
| *Diacamma* | *rugosum sculptum* (Jerdon, 1851) | - | Soil |
| **Distribution in Kerala**: Kollam (Thenmala), Thrissur (Chimmnoy Wildlife Sanctuary, KAU Campus), Wayanad (Thirunelli). | | | |
| *Diacamma* | *scalpratum* (Smith, 1858) | *Diacamma compressum* Mayr, 1879 | Soil |
| **Distribution in Kerala**: Kollam (Thenmala), Calicut (Mampad), Wayanad (Thirunelli). | | | |
| *Leptogenys* | *ocellifera* (Roger, 1861) | - | Soil |
| **Distribution in Kerala**: Kollam (Thenmala), Wayanad (Thirunelli), Malappuram (Madappally). | | | |
| *Odontomachus* | *haematodes* (Linnaeus, 1758) | *Odontomachus hirsutiusculus* Smith, 1858<br>*Odontomachus maxillosa* (De Geer, 1773)<br>*Odontomachus pallipes* Crawley, 1916 | Soil |
| **Distribution in Kerala**: Kollam (Thenmala), Malappuram (Madappally), Calicut (Mampad), Wayanad (Thirunelli). | | | |


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# 13. FIRST REPORT ON THE OCCURRENCE OF AN ECONOMICALLY IMPORTANT SPIRAL NEMATODE *HELICOTYLENCHUS MULTICINCTUS* COBB. FROM GOA


I.K. Pai[1] and H.S. Gaur[2]

[1]Department of Zoology, Goa University, Goa 403 206, India. Email: ikpai@unigoa.ac.in
[2]Division of Nematology, Indian Agricultural Research Institute, New Delhi 110 012, India. Email: hsg_nema@iari.res.in


Nematodes constitute the largest and diverse group of metazoans on earth. Four of every five metazoans are nematodes. Of the estimated 5,00,000 species of nematodes, only *c.* 25,000 are known till date (Walia and Bajaj 2003). They may feed on bacteria, algae, fungi and may also be parasitic on plants and animals.

Among nematodes, spiral nematode *Helicotylenchus multicinctus* Cobb. is a well-known plant parasitic nematode causing severe damage to banana plantation. There are reports on the role of *H. multicinctus* on banana by Baghel and Edwards (1977) and Rajendran *et al.* (1979). Goa produces a large quantity of bananas; however, *H. multicinctus* has not been recorded so far.

Soil samples were collected at a depth of 15-30 cm from a banana plantation in Canacona, Goa. Nematodes were extracted using Cobb's decanting and sieving technique (Cobb 1904, 1913). Based on the studies of morphological characters, the nematode was identified as *Helicotylenchus multicinctus*.


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